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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATEL, JAYESH A

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/660,683	Applicant(s) EBISAWA, TAKASHI	
	Examiner JAYESH A. PATEL	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Response to Arguments

1. The arguments to the last office action has been entered and made of record. Tanaka discloses pluralities of thresholds in the reference. When the input edge signal is less than the first edge threshold T2, indicates that the pixel is not an edge and is part of the background **(a part of an image)** at **(Col 5 Lines 36-45)**. The first edge threshold is set to detect large changes in the density i.e **(from low to high or from high to low)**. This is meant that Tanaka is trying to detect text **(black having high density)** from the background **(white having less density)** or vice versa which is **(detecting white text in the black background (having large density change from the black background))**. Tanaka further discloses a second edge threshold T3 which is set to detect the intermediate sharp edges **(slightly large changes in the densities)** further going deeper in the image and Tanaka further discloses a threshold T8 which is set to detect pixels of **(small or almost no change in the density)** at **(Col 5 Lines 46-65)**. Tanaka also discloses that the threshold values are set such that the third edge threshold T8 is smaller than the second edge threshold T3 which is smaller than the first edge threshold T2 which also means **(T2 is greater than T3 which is greater than T8)** which is what the invention is about. Thus it can be seen that

Tanaka teaches discloses multiple thresholds for discrimination of edges of the images. The examiner made the interpretation of the claim in which the limitation **“the background of the border of the original”** is not defined and it could be interpreted as the edge of the original and not the area near to the edge of the original. Tanaka further discloses in Fig 12 an edge detection circuit 7 and a thin line detection circuit 5. Further the changes in the densities due to gradation form the edges. In view of the examiner’s understanding and the claim limitation not defined Tanaka discloses the limitations of claim 1 as argued by the applicant. In order for the further understanding and to make the clarification in the prosecution the rejection is discussed below.

2. The arguments to Claims 2 and 3 on page 3 are not specific and are based on Claim limitations of Claim 1. See the above explanation.

Claim Objections

Claim 1 is objected to because of the following informalities: The limitation “a thinnest line” in line 17 should be replaced with “the thinnest line”. Appropriate correction is required.

Claim 1 is written in the form which does not differentiate the stoppage point of the limitations for e.g. the claim recites “the density of the relevant pixel is higher than a first threshold value ---- higher than the density of the background of the border of the original and not higher than the density of a thinnest line in lines

which form said characters --- and is not higher than a second threshold value --- not lower than the density of a thinnest line in lines which form said characters". It is very hard to make clear understanding of the claim language. The examiner requests the applicant to amend the claim making clear distinctions between the limitations by adding words such as "the first threshold value is higher than the background" etc which makes a clear understanding of the claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 recites the limitation "the background of the border of the original" in line

14. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka

(US 5548415) hereafter Tanaka in view of Shimizu (US 5774578) hereafter

Shimizu.

1. Regarding claim 1, Tanaka discloses an image processing system (**Figs 4, 12-16**) which comprises an object pixel detecting means which determines whether relevant pixels (**certain pixel Fig 16**) in the character image information obtained by reading an original on which characters (**Col 2 Line 57**) have been recorded are object pixels (**edge pixels**) to be subjected to enhancement processing and carries out enhancement processing on pixels determined to be object pixels, thereby carrying out edge enhancement processing on the character image information and a thin line image detecting section (**Fig 12 Element 5**) which determines the relevant pixel to be a thin line pixel forming a part of a thin line image (**Fig 12 Element 5**), and determines that the relevant pixel is an object pixel when the density judgment section determines the relevant pixel to be a prospective object pixel and the thin line image detecting section determines the relevant pixel to be a thin line pixel at (**Col 9 Lines 25-67 and Col 10 Lines 1-24**). Tanaka discloses **pluralities of thresholds** to distinguish the images of (**large changes in the densities, slightly large changes in the densities and small or no changes in the densities at (Col 5 Lines 35-63)**), however does not explicitly recite that the thresholds are used for separating the background and the character. Shimizu discloses judging (**a black image in the white background or a white image in the black background and also further discloses using two thresholds separating the background from the character at (Fig 11A-11E, Col 14 Lines 42 through Col 15 Lines 11)**).

Shimizu further discloses that the frequencies of pixels having density larger than

the first threshold but smaller than the second threshold to distinguish the background from the character. Shimizu discloses the apparatus for correcting the images **(black images in white background, white images in black background and thin line images at Col 13 Lines 3-6 and Col Fig 11A-11E)** wherein the improvement comprises that the object pixel detecting means comprises a density judgment section **(CPU 10 generates a density histogram of the designated area at Col 14 Lines 5-10)** which determines the relevant pixel to be a prospective object pixel when the density of the relevant pixel **(Pixel X in Fig 5A)** is higher than a first threshold value **(frequencies having densities which are larger than the first density threshold DthL at Col 14 Lines 52-53)** higher than the density of the background of the border of the original **(DthL greater than the frequency of the density Nth corresponding to the background as it is lower as seen in Figs 12A-12B)** and not higher **(smaller or lower)** than the density of a thinnest line **(obtaining the accumulated frequency value NthM which is higher than the first threshold value but is smaller than the second threshold value)** in lines which form said characters and is not higher **(smaller or lower)** than a second threshold value **(frequencies having densities smaller than the second density threshold value DthH at Col 14 Lines 53-55)** not lower than **(equal or higher)** the density of a thinnest line in lines which form said characters. Shimizu discloses that frequencies having larger density values than the second threshold value DthH are counted which shows that the densities with respect to the thinnest line or

dense edges is present at **(Col 14 lines 56-59)**. Shimizu discloses obtaining the accumulated frequency values of Nth, NthL, NthM and NthH and compares with each other to determine the black image in the white background or white image in the black background at **(Col 15 Lines 1-10)**. Shimizu discloses that the apparatus and method as disclosed improves the quality of the image **(density segmentation and then applying the appropriate correction)** in all areas even if the images exist together at **(Col 4 Lines 47-52)**. Shimizu and Tanaka are from the same field of endeavor and are analogous art therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the teachings of Shimizu of density segmenting using thresholds in the apparatus of Tanaka for the above reasons.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Shimizu and in further view of Huang (US 6175659) hereafter Huang.

2. Regarding Claim 2, Tanaka and Shimizu discloses an image processing system as defined in claim 1. Tanaka discloses the density conversion circuit 3 in **(Figs 1,8 and 12)** which performs the enhancement **(selection of the appropriate density curve or values at Col 6 Lines 1-65)** and Shimizu discloses various correction procedures from the selection at **(Col 4 Lines 17-20)**, however do not disclose and are silent in which relevant pixels which have

not been determined to be an object pixel are subjected to a weak enhancement processing the degree of enhancement of which is weaker than that of the enhancement processing for said edge enhancement processing.

Huang discloses an **(adaptive edge enhancement device Fig 1)** in which relevant pixels which have not been determined to be an object pixel are subjected to a weak enhancement processing the degree of enhancement **(generated by the set of thresholds T1-T4)** of which is weaker than that of the enhancement processing for said edge enhancement processing at **(Col 4 Lines 16-46)**. Huang discloses that the device as disclosed in which the enhancement modes are dynamic provides a better image quality at **(Col 1 Lines 32-35)**. Tanaka, Shimizu and Huang are from the same field of endeavor and are analogous art, therefore it would have been obvious for one of ordinary skill in the art, at the time the invention was made to have used the teachings of adaptive edge enhancement as taught by Huang in the apparatus of Tanaka and Shimizu for the above reasons.

3. Regarding Claim 3, Tanaka and Shimizu discloses an image processing system as defined in claim 1. Tanaka disclose further comprises a density difference calculating means **(Fig 15 distance calculating circuit and Col 11 Lines 23-37)** which calculates the difference in density between a non-object pixel **(not an edge, could be close to edge or gradation)** and the surrounding pixels **(one of the surrounding pixel could be an edge pixel)** adjacent to the

non-object pixel and carries out a weak enhancement (**density conversion Fig 12 Element 3**) processing on the non-object pixel (**not an edge, could be close to edge or gradation**) when the difference in density is larger (**greater**) than a predetermined third threshold value (**Col 5 Lines 56-57 and 61-63**) and does not carry out the weak enhancement (**density conversion**) processing when the difference in density is not larger than the third threshold value. Huang also discloses an adaptive edge enhancement apparatus depending on the threshold values used in detecting the density gradients in fig 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAYESH A. PATEL whose telephone number is (571)270-1227. The examiner can normally be reached on M-F 7.00am to 4.30 pm (5-4-9). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair->

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/Jayesh A Patel/
Examiner, Art Unit 2624

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624